NC/QC/YD/2020-21/AL/W3-C1 Date: 22-03-2021

1. TEST REPORT ON CEMENT:

Sub: Testing of 53 Grade Cement Sample (IS 12269-1987).
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh.N, Bangalore.

PHYSICAL TESTS ON CEMENT

Grade * : 53,
Type * : O.P.C

TABLE 1.1:

SL No	Name of Test	Test Results	Requirements as per IS 8112-1989
1	Initial setting time	151 min	Shall not be less than 30 min
2	Final setting time	290 min	Shall not be more than 600 min
3	Fineness (by dry sieving on IS 90 micron sieve)	2.03 %	Not to exceed 10.0%
4	Soundness test(by Le-Chatelier's method)	1.96 mm	Shall not be more than 10 mm
5	Compressive strength a) 3 days (average of three results)	28.57 N/Sq mm	Shall not be less than 27 N/Sqmm

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3-PCC1 **Date: 22-03-2021**

1. TESTING OF COARSE AND FINE AGGREGATES:

Sub: Testing of Coarse and Fine aggregates to be used for bed concrete.
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh.N, Bangalore.

1. COARSE AGGRGATES TABLE - SIEVE ANALYSIS:

IS Sieve Size, mm	Percentage passing	Requirements as per IS 383-1970 (Reaffirmed on 2007) % Passing	
	40 mm Sample	Single size	Graded
40mm	100.00	85-100	90 – 100
20mm	58.65	0 -20	30- 70
10mm	23.10	0 -5	10- 35
4.75mm	3.80	------	0- 5

2. FINE AGGREGATES TABLE - SIEVE ANALYSIS

IS Sieve Size, mm	Percentage Passing	Specification as Per IS: 383-1970(Reaffirmed 2002) Percentage Passing			Remarks
		Zone-I	Zone-II	Zone -III	
04.75	97.40	90-100	90-100	90-100	The Sample Conforms to Grading **Zone-II**
02.36	81.05	60-95	75-100	85-100	
01.18	78.60	30-70	55-90	75-100	
600.mic	44.95	15-34	35-59	60-79	
300.mic	16.30	5-20	8-30	12-40	
150.mic	8.55	0-10	0-10	0-10	

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3-CE1 **Date: 24-03-2021**

1. TEST REPORT ON CEMENT:

Sub: Testing of 53 Grade Cement Sample (IS 12269-1987).
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh N, Bangalore.

PHYSICAL TESTS ON CEMENT

Grade * : 53,
Type * : O.P.C

TABLE 1.1:

SL No	Name of Test	Test Results	Requirements as per IS 8112-1989
1	Initial setting time	169 min	Shall not be less than 30 min
2	Final setting time	282 min	Shall not be more than 600 min
3	Fineness (by dry sieving on IS 90 micron sieve)	2.02 %	Not to exceed 10.0%
4	Soundness test(by Le-Chatelier's method)	1.99 mm	Shall not be more than 10 mm
5	Compressive strength a) 3 days (average of three results)	28.31 N/Sq mm	Shall not be less than 27 N/Sqmm

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3-CA1 Date: 24-03-2021

1. TESTING OF COARSE AGGREGATES (20 mm):

Sub: Testing of Construction Materials.
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh.N, Bangalore.

Table - 1.1 : SIEVE ANALYSIS :

IS Sieve Size, mm	Percentage passing	Requirements as per IS 383-1970 (Reaffirmed on 2002) % Passing	
	20 mm Sample	Single size	Graded
40 mm	100.00	100 00	100 00
20 mm	96.25	85-100	90 - 100
10 mm	53.10	0 - 20	25 - 55
4.75 mm	3.60	0 - 5	0 - 10

TABLE 1.2 :

SL No	Test conducted	Results	Requirements as per IS 383-1970 & Tests Conforms to IS 2386(Part I to IV) – 1963 (Reaffirmed on 2002)
1.	Flakiness Index	26.71%	Not to exceed 25 %
2.	Crushing value	27.62 %	Not to exceed 45 % for concrete other than for wearing surfaces and 30% for concrete for wearing surfaces

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3-S1 Date: 24-03-2021

1. TEST REPORT ON REINFORCEMENT STEEL:

Sub: Testing of Reinforcement Steel of diameter 10 and 12 mm **TMT Steel.**
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh.N, Bangalore.

TABLE – 1

SL No	Details	For 10 mm		For 12 mm	
		Test Results	Min Req as per IS 1786-2008	Test Results	Min Req as per IS 1786-2008
01	Observed diameter of bar	**10.0 mm**	10.0 mm	**12.0 mm**	12.0 mm
02	Observed Wt/m Length **Kg/m**	**0.621**	0.567	**0.894**	0.834
03	Proof stress/Yield stress, fy , **N/mm^2**	**542.0**	500.0	**553.0**	500.0
04	Bend/ Re bend Test	**Ok**	---	**Ok**	---
05	Percentage of Elongation, %	**21.01**	12.00	**20.70**	12.00
06	Ultimate Tensile Strength **N/mm^2**	**634.00**	545.0	**649.0**	545.0

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3-CB1 Date: 02-04-2021

1. TEST REPORT ON CEMENT CONCRETE CUBES:

Sub: Testing of Concrete Cubes (for 07days Compressive Strength).
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh.N, Bangalore.

RESULTS OF COMPRESSIVE STRENGTH ON CEMENT CONCRETE

CUBE SPECIMENS

Dimensions of Specimen : 150 X 150 X 150mm

Grade of Concrete* : M_{20}

TABLE 1.1:

Sl No	Location/ Identification*	Date of Casting*	Date of Testing	Age in Days	C/S Area in mm^2	Maximum Load in K.N	Compressive Strength (N/mm^2)	Avg. Value
1	001	26-03-21	02-04-21	07	22500	370	16.44	16.15
	002	"	"	"	"	365	16.22	
	003	"	"	"	"	355	15.78	

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3-CB2 Date: 05-04-2021

1. TEST REPORT ON CEMENT CONCRETE CUBES:

Sub: Testing of Concrete Cubes (for 07days Compressive Strength).
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh.N, Bangalore.

RESULTS OF COMPRESSIVE STRENGTH ON CEMENT CONCRETE

CUBE SPECIMENS

Dimensions of Specimen : 150 X 150 X 150mm

Grade of Concrete* : M_{20}

TABLE 1.1:

Sl No	Location/ Identification*	Date of Casting*	Date of Testing	Age in Days	C/S Area in mm^2	Maximum Load in K.N	Compressive Strength (N/mm^2)	Avg. Value
1	001	29-03-21	05-04-21	07	22500	360	16.00	**16.37**
	002	"	"	"	"	375	16.67	
	003	"	"	"	"	370	16.44	

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3-CB1A **Date: 23-04-2021**

1. TEST REPORT ON CEMENT CONCRETE CUBES:

Sub: Testing of Concrete Cubes (for 28days Compressive Strength).
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh.N, Bangalore.

RESULTS OF COMPRESSIVE STRENGTH ON CEMENT CONCRETE

CUBE SPECIMENS

Dimensions of Specimen : 150 X 150 X 150mm

Grade of Concrete* : M_{20}

TABLE 1.1:

Sl No	Location/ Identification*	Date of Casting*	Date of Testing	Age in Days	C/S Area in mm^2	Maximum Load in K.N	Compressive Strength (N/mm^2)	Avg. Value
1	001	26-03-21	23-04-21	28	22500	510	22.67	22.89
	002	"	"	"	"	515	22.89	
	003	"	"	"	"	520	23.11	

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3-CB3A

Date: 29-04-2021

1. TEST REPORT ON CEMENT CONCRETE CUBES:

Sub: Testing of Concrete Cubes (for 28days Compressive Strength).
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh.N, Bangalore.

RESULTS OF COMPRESSIVE STRENGTH ON CEMENT CONCRETE

CUBE SPECIMENS

Dimensions of Specimen : 150 X 150 X 150mm

Grade of Concrete* : M_{20}

TABLE 1.1:

Sl No	Location/ Identification*	Date of Casting*	Date of Testing	Age in Days	C/S Area in mm^2	Maximum Load in K.N	Compressive Strength (N/mm^2)	Avg. Value
1	001	01-04-21	29-04-21	28	22500	500	22.22	**22.74**
	002	"	"	"	"	520	23.11	
	003	"	"	"	"	515	22.89	

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3- WMM1 Date: 07-04-2021

TEST REPORT ON WET MIX MACADAM MIX
(GRADATION TEST)

Sub: To conduct Gradation test on Wet Mix Macadam (WMM) Mix.
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh N, Bangalore.

TEST RESULTS

1. Gradation Test:
TABLE 1.1

Sieve Size mm	Percent by Weight passing the Sieve from the sample supplied (Obtained Gradation)	Specified Limits as per MoRTH Specifications, V Revision-2013
53.00	100.00	100
45.00	97.30	95-100
26.50	---	-
22.40	69.10	60-80
11.20	44.75	40-60
4.75	28.30	25-40
2.36	17.55	15-30
0.600	12.90	8-22
0.075	4.25	0-5

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3- WMM3 Date: 12-04-2021

TEST REPORT ON WET MIX MACADAM MIX

(GRADATION TEST)

Sub: To conduct Gradation test on Wet Mix Macadam (WMM) Mix.
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh N, Bangalore.

TEST RESULTS

1. Gradation Test:

TABLE 1.1

Sieve Size mm	Percent by Weight passing the Sieve from the sample supplied (Obtained Gradation)	Specified Limits as per MoRTH Specifications, V Revision-2013
53.00	100.00	100
45.00	95.30	95-100
26.50	---	-
22.40	71.90	60-80
11.20	52.40	40-60
4.75	36.55	25-40
2.36	20.65	15-30
0.600	19.30	8-22
0.075	4.75	0-5

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3-BD1 **Date: 16-04-2021**

1. TEST REPORT ON BITUMEN SAMPLE:

Sub: Testing of Bitumen sample VG-30 Grade.
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh N, Bangalore.
Technical Reference: Ministry of Road Transport and Highways, V Revision, 2013 and IS 73: 1992.

TABLE 1.1 ;

SL No	Details	Test Results	Requirements as per I.S 73 –1992 Specifications
1.	Penetration at 25^0 C	**52.90^0 C**	Min. 45
2.	Ductility Value at 25^0 C	**106.20 cm**	40
3.	Flash point	**243^0 C**	Minimum 220^0 C
4.	Softening point	**51.10^0 C**	Min. 47

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3-DS1 Date: 21-04-2021

1.TEST REPORT ON BITUMINOUS MIXES :

(STABILITY OF BITUMINOUS MIX)

Sub: To determine the stability of bituminous mix for DBM mix sample.
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh N, Bangalore.

TEST RESULTS

Table 1: Properties of DBM (Gr-2) Mix

Sl. No.	Test Property	*Test results obtained by Marshall method	Requirements of Dense Bituminous Macadam, Grade-2 as per M.o.R.T&H (IV Revision)-2001 Specifications
1	Marshall Stability (75 blows) (At 60°C), kgs.	**1226**	900
2	Marshall Flow at 60°C, mm.	**3.39**	2.0 - 4.0

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3-DBM3

Date: 22-04-2021

1.TEST REPORT ON BITUMINOUS MIXES :
(BITUMEN EXTRACTION TEST & GRADATION TEST)

Sub: To determine the percentage of bitumen and gradation for DBM mix sample.
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh.N, Bangalore.

TEST RESULTS

A. Type of Construction : **Dense Graded Bituminous Macadam.**
1. The bitumen content obtained after subjecting the sample for Bitumen Extraction test = **4.53 %**

2. **Gradation Test**
TABLE 1.1

Sieve Size, mm	Percent by Weight passing the Sieve from the sample supplied (Obtained Gradation)	Gradation requirement as per Table 500-10 of MORTH Specfications-2013 DBM (Grading - 2)
37.5	100	100
26.5	96.15	90-100
19.0	88.25	71-95
13.20	74.40	56-80
4.75	43.70	38-54
2.36	37.05	28-42
0.300	19.90	7-21
0.075	7.25	2-8

The result of the materials tested meets the standards and hence can be used for the work.

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NC/QC/YD/2020-21/AL/W3-BB1

Date: 19-04-2021

1. TEST REPORT ON BITUMEN SAMPLE:

Sub: Testing of Bitumen sample VG-30 Grade.
{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}
Ref.: Material testing/PMC/20-21,
Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.
Name of the Agency/Contractor*: Umesh.N, Bangalore.
Technical Reference: Ministry of Road Transport and Highways, V Revision, 2013 and IS 73: 1992.

TABLE 1.1 ;

SL No	Details	Test Results	Requirements as per I.S 73 –1992 Specifications
1.	Penetration at 25^0 C	**51.80^0 C**	Min. 45
2.	Ductility Value at 25^0 C	**102.0 cm**	40
3.	Flash point	**231^0 C**	Minimum 220^0 C
4.	Softening point	**50.90^0 C**	Min. 47

The result of the materials tested meets the standards and hence can be used for the work.

ಸಹಾಯಕ ಕಾರ್ಯನಿರ್ವಾಹಕ ಅಭಿಯಂತರರು
ಯಲಹಂಕ ಉಪನಗರ ಉಪವಿಭಾಗ,
ಬಿ.ಬಿ.ಎಂ.ಪಿ. ಬೆಂಗಳೂರು-106

NEWZEN CONSULTANT * Bangalore *

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NC/QC/YD/2020-21/AL/W3-BS2 Date: 24-04-2021

1.TEST REPORT ON BITUMINOUS MIXES :

(STABILITY OF BITUMINOUS MIX)

Sub: To determine the stability of bituminous mix for BC mix sample.

{Project*: Improvements to roads and drains at Ambabhavani Layout (Part-1) In Ward No.03.}

Ref.: Material testing/PMC/20-21,

Report Required for: Assistant Executive Engineer,
Yelahanka Newtown Sub Division,
BBMP, Bangalore.

Name of the Agency/Contractor*: Umesh.N, Bangalore.

TEST RESULTS

Table 1: Properties of BC (Gr-2) Mix

Sl. No.	Test Property	*Test results obtained by Marshall method	Requirements of Bituminous Concrete, Grade-2 as per M.o.R.T&H (V Revision)-2013 Specifications
1	Marshall Stability (75 blows) (At 60°C), kgs.	1394	900
2	Marshall Flow at 60°C, mm.	3.21	2.0 - 4.0

The result of the materials tested meets the standards and hence can be used for the work.

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